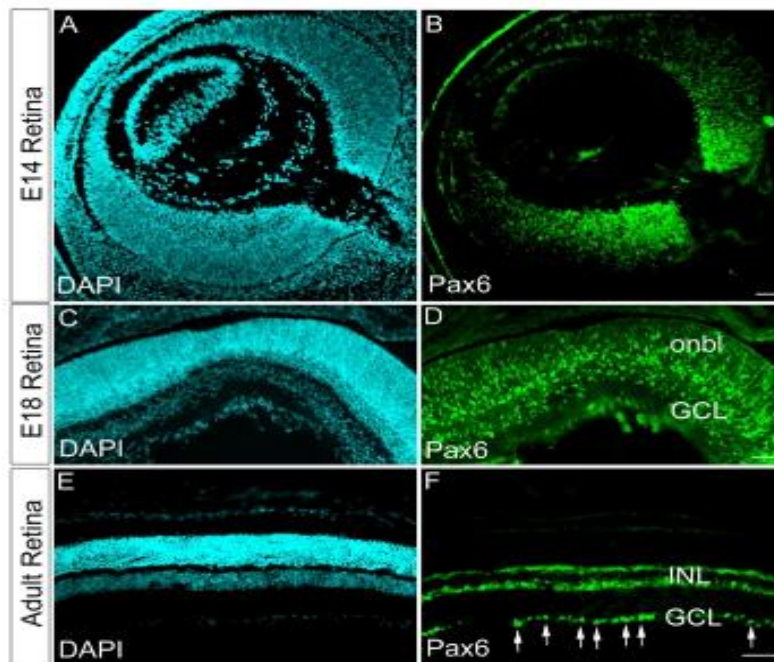


Pax6 modulates intra-retinal axon guidance and fasciculation of retinal ganglion cells during retinogenesis – An intervention by DBT-RGCB

Dr. Jackson James, a developmental biologist, at DBT's Rajiv Gandhi Center for Biotechnology (DBT-RGCB), Thiruvananthapuram and his team wanted to understand how a retinal degenerative disorder, Glaucoma, can be reversed back by understanding the retinal developmental basics. Earlier team had ventured of stem cell derived cell transplantation approach to replenish the dying cells in the retina of a mouse model. But it was a partial success since the transplanted cell was not functionally integrated into the host retina. This time the group has taken a different approach.



However, in a recent study published in the journal *Scientific Reports*, the group dissected the function of a master regulator gene i.e. Pax6 and found that this gene regulates the factor for the functional integration of the cells. The retinal ganglion cells carry the visual information from the eye to the brain visual center through their long axons. Upon knocking Pax6 gene out from the mouse retina it was found that the axons of the retinal ganglion cells were defasciculated (growing out of the cluster) severely along with the abnormal secretion of extracellular matrix that caused a hostile environment for functional integration of the cells. Thus, a conducive environment is maintained by Pax6 during development that can be mimicked to guide the nascent axons of transplanted retinal ganglion cells.

Every living creature in this world is armored with the sense organs for their survival. Human beings are not an exception to it. Every day we are flooded with vision, sounds, smell, taste and touch. Each of our sensory system is enormously complex but meticulously designed. This designing process starts during the developmental period in the mother's womb. Along with other sensory systems the visual system development is increasingly popular in the research community because of the several disorders related to the impairment of vision. To address either the genetic disorder or neuro degenerative disorder scientists study the developmental process to understand the clue which can be mimicked at the time of treatment.

Link: <https://www.nature.com/articles/s41598-020-72828-4>

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